highly doped second-type semiconductor material. The Zener diode may also include an electrode for biasing the isolation tub.

[0050] While at least one exemplary embodiment has been presented in the foregoing detailed description, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or embodiments described herein are not intended to limit the scope, applicability, or configuration of the claimed subject matter in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing the described embodiment or embodiments. It should be understood that various changes can be made in the function and arrangement of elements without departing from the scope defined by the claims, which includes known equivalents and foreseeable equivalents at the time of filing this patent application.

What is claimed is:

1. A Zener diode comprising:

a substrate including semiconductor material;

a first region having a first conductivity type, formed in the semiconductor material;

a second region having a second conductivity type, formed in the semiconductor material and overlying the first region, wherein the second conductivity type is opposite the first conductivity type; and

an electrode formed in the second region, wherein the electrode is electrically coupled to the first region.

2. The Zener diode of claim **1**, further comprising a plug region having the first conductivity type, the plug region extending from the electrode to the first region.

3. The Zener diode of claim **2**, further comprising a first outer region having the first conductivity type, the first outer region being outboard the first region and the second region, and the first region extending to the first outer region.

4. The Zener diode of claim **3**, wherein:

the first outer region is electrically connected to the first region;

the first region is electrically connected to the plug region; and

the plug region is electrically connected to the electrode.

5. The Zener diode of claim **4**, wherein:

the first outer region physically contacts the first region;

the first region physically contacts the plug region; and

the plug region physically contacts the electrode.

6. The Zener diode of claim **2**, further comprising a third region formed in the second region, the third region having the second conductivity type, and the third region extending from the electrode.

7. The Zener diode of claim **6**, wherein the third region is electrically connected to, and physically contacts, the electrode.

8. The Zener diode of claim **6**, wherein the plug region comprises a plurality of plugs having the first conductivity type.

9. The Zener diode of claim **6**, wherein at least a portion of the plug region is flanked by the third region.

10. The Zener diode of claim **1**, further comprising an isolation structure formed in the semiconductor material, the isolation structure at least partially surrounding the first region and the second region.

11. The Zener diode of claim **10**, wherein the Zener diode is substantially free of substrate injection current when reverse biased.

12. The Zener diode of claim **1**, wherein the first conductivity type is n-type and the second conductivity type is p-type.

13. The Zener diode of claim **1**, wherein the first conductivity type is p-type and the second conductivity type is n-type.

14. The Zener diode of claim **1**, further comprising conductive routing that electrically couples the electrode to the first region.

15. The Zener diode of claim **14**, wherein the conductive routing comprises a local interconnect.

16. A Zener diode comprising:

a substrate including semiconductor material;

an isolation tub located in the semiconductor material, the isolation tub generally defining a first interior volume;

a first-type well region located in the semiconductor material, the first-type well region being generally configured as a sidewall located within the first interior volume, the sidewall generally defining a second interior volume;

a first-type region located in the semiconductor material, the first-type region being located within the second interior volume;

a second-type region formed in the semiconductor material, the second-type region being located within the second interior volume and overlying the first-type region;

an electrode region formed in the second-type region;

a first-type plug region extending from the electrode region to the first-type region, the first-type plug region electrically connecting the electrode region to the first-type region; and

a Zener region formed in the second-type region, the Zener region extending from the electrode region toward the first-type region.

17. The Zener diode of claim **16**, wherein the first-type plug region extends from a portion of the electrode region to the first-type region.

18. The Zener diode of claim **16**, wherein the first-type region is electrically connected to the first-type well region.

19. The Zener diode of claim **16**, wherein:

the isolation tub comprises moderately doped second-type semiconductor material;

the first-type well region comprises moderately doped first-type semiconductor material;

the first-type region comprises moderately doped first-type semiconductor material;

the second-type region comprises moderately doped second-type semiconductor material;

the electrode region comprises highly doped first-type semiconductor material;

the first-type plug region comprises moderately doped first-type semiconductor material; and

the Zener region comprises highly doped second-type semiconductor material.

20. The Zener diode of claim **16**, further comprising an electrode for biasing the isolation tub.

* * * * *